

REMARKS/ARGUMENTS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1-7 are pending in the application. Claim 1 is amended by the present amendment. Support for amended Claim 1 can be found in the original specification, claims and drawings.<sup>1</sup> Thus, no new matter is added.

In the outstanding Official Action, Claims 1-2 and 5-6 were rejected under 35 U.S.C. § 103(a) as unpatentable over Komatsu (U.S. Pub. No. 2001/002146) in view of Fukunishi (U.S. Pub. No. 2001/0052889) and Claims 3-4 and 7 were rejected under 35 U.S.C. § 103(a) as unpatentable over Komatsu in view of Fukunishi and in further view of Kim et al. (U.S. Pub. No. 2004/0263755, hereinafter "Kim").

The Official Action rejected Claims 1-2 and 5-6 under 35 U.S.C. § 103 as unpatentable over Komatsu in view of Fukunishi. Applicants respectfully submit that amended Claim 1 states novel features clearly not taught or rendered obvious by the applied references.

The present inventors recognized a deficiency in in-plane switching mode active matrix liquid crystal display devices. Specifically, when only one voltage supply path is provided through the pixel electrode to the capacitor terminal and is disconnected, no voltage is supplied to the capacitor terminal. Therefore, it is unable to generate the necessary capacitance, producing defects such as display flicker. To remedy this deficiency the present inventors arrived at the liquid crystal display device, as recited in amended Claim 1.

Amended Claim 1 relates to a liquid crystal display device having a capacitor terminal placed opposite to a capacitor electrode and which is connected to a pixel electrode. A *drain electrode is electrically connected to the capacitor terminal through the pixel electrode* and

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<sup>1</sup> Specification Fig. 1.

the pixel electrode includes *at least two voltage supply paths to the capacitor terminal*.

Thus, the claimed liquid crystal display device is capable of supplying a voltage to a capacitor terminal to generate the necessary capacitance even in the case when a pixel electrode connection is disconnected.

In a non-limiting example, Fig. 1 of the present specification shows a pixel electrode (4), which is connected to a capacitor terminal (12) at a plurality of connection holes (6), and the drain electrode (11) is connected to the capacitor terminal (12) through the pixel electrode (4). Thus, the pixel electrode connects directly to the capacitor terminal via at least two distinct voltage supply paths.

The requirements for a *prima facie* case of obviousness are (1) there must be some suggestion or motivation in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or to combine the reference teachings, (2) there must be a reasonable expectation of success, and (3) the prior art reference must teach or suggest all the claim limitations. It is respectfully submitted that the applied references fail to make a *prima facie* case of obviousness, because neither Komatsu nor Fukunishi, alone or in combination, teach or suggest all the claim limitations.

Amended, Claim 1 recites, *inter alia*, a liquid crystal display device comprising:

*...a drain electrode electrically connected to the capacitor terminal through the pixel electrode...*

Komatsu describes a liquid crystal display device including a pixel region having a drain electrode (107) that is directly connected to the data electrode, or pixel electrode (108), and that the pixel electrode (108) is in contact with insulating layers (112/120).<sup>2</sup> Specifically, Fig. 3b shows that the pixel electrode (108) is sandwiched between a plurality of insulating layers (112/120), and that the capacitor electrode (103) and common electrode (109) are provided on the outer surfaces of the bottom and top insulating layers, respectively.

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<sup>2</sup> Komatsu ¶ [0030-0033].

However, Komatsu, fails to teach or suggest that his device includes a *capacitor terminal* to which the pixel electrode is connected, as recited in amended Claim 1. In an exemplary, non-limiting embodiment, Fig. 2 of the present specification shows that the pixel electrode (4) is electrically connected to the capacitor terminal (12). Komatsu, on the other hand, fails to describe that a *capacitor terminal* is provided in his disclosure whatsoever, instead the pixel electrode (108) is only capacitively connected to a plurality of insulating layers (120/112). Thus, Komatsu fails to teach or suggest a drain electrode electrically connected to the *capacitor terminal* through the pixel electrode, as recited in amended Claim 1.

Turning to the secondary reference, Fukunishi describes a liquid crystal display panel (30) having a connection electrode (5a) which is one of two electrodes formed on an extension portion of a drain electrode (5) which is disposed above a capacitance electrode (11a).<sup>3</sup> On an upper side of the connection electrode (5a), a contact hole (6a) is provided allowing pixel electrode (7) to be in contact with the connection electrode (5a). Fukunishi also describes that a drain branch thin line portion (32) branches off from the drain thin line portion (31) which is extended from the drain electrode (5). Thus, the pixel electrode (7) has two connections, one of which is a connection with the connection electrode (5a) through the contact hole (6a) and the other is a connection with the branch-side connection electrode (33) through the contact hole (6d).<sup>4</sup>

Thus, in Fukunishi's configuration, the capacitor terminal is connected to both the drain electrode (5) and the pixel electrode (7). Specifically, the capacitor terminal (5a) is located between the drain electrode (5) and the pixel electrode (7) and the drain electrode is not electrically connected to the capacitor terminal *through the pixel electrode*, as recited in amended Claim 1.

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<sup>3</sup> Fukunishi ¶ [0124], and Fig. 4.

<sup>4</sup> Fukunishi ¶ [0128], and Fig. 4.

Further, Claim 1 recites, *inter alia*, a liquid crystal display device comprising:

... a capacitor terminal placed opposite to the capacitor electrode...

the pixel electrode ***comprises at least two voltage supply paths to the capacitor terminal.***

The outstanding Official Action properly admits that Komatsu fails to teach or suggest the above-noted claimed feature. In an attempt to cure this deficiency in Komatsu, the outstanding Official Action relies on Fukunishi, specifically citing Fig. 4 and paragraph [0151].

As discussed in detail above, Fig. 4 of Fukunishi describes that the pixel electrode (7) has two connections, one connection with the connection electrode (5a) through the contact hole (6a) and another connection with the branch-side connection electrode (33) through the contact hole (6d). Thus, in Fig. 4 of Fukunishi, the pixel electrode does not include ***at least two voltage supply paths to the capacitor terminal***, as recited in Claim 1. Instead, the pixel electrode of Fukunishi includes a plurality of connections ***each to one of two different capacitor terminals***, one being connection electrode (5a), the other to branch-side connection electrode (33).

Accordingly, Applicants respectfully request that the rejection of Claim 1 under 35 U.S.C. § 103 be withdrawn. As Claims 2 and 5-6 depend from Claim 1, Applicants respectfully submit that these claims also patentably define over Komatsu and/or Fukunishi.

In the outstanding Official Action, Claims 3-4 and 7 were rejected under 35 U.S.C. § 103(a) as unpatentable over Komatsu in view of Fukunishi and in further view of Kim. Applicants respectfully traverse this rejection.

As discussed above, Komatsu, neither alone nor in combination with Fukunishi, teach nor suggest Applicants' configuration of a pixel electrode having at least two voltage supply paths to a capacitor terminal and wherein the drain electrode is electrically connected to the capacitor terminal through the pixel electrode. Likewise, Kim does not remedy this

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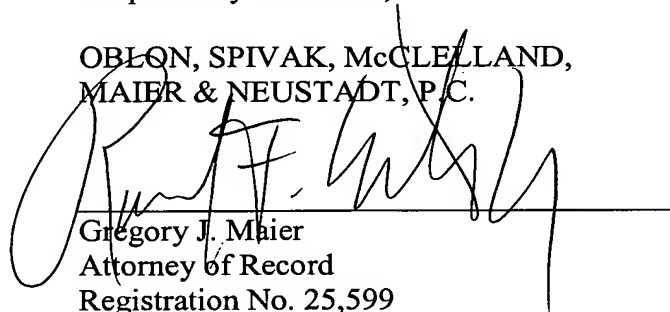
deficiency, and therefore, none of the cited references either alone or in combination teach or suggest Applicants' Claims 3-4 and 7 which include the above distinguished limitations by virtue of dependency. Therefore, the Official Action does not provide a *prima facie* case of obviousness with regard to any of these claims.

Accordingly, Applicants respectfully request the rejection of Claims 3-4 and 7 under 35 U.S.C. § 103 be withdrawn.

Consequently, in light of the foregoing comments, it is respectfully submitted that the invention defined by Claims 1-7 is patentably distinguishing over the applied references. The present application is therefore believed to be in condition for formal allowance and an early and favorable reconsideration of the application is therefore requested.

Respectfully submitted,

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